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ABSTRACT

A superconducting electromagnet apparatus comprises a main coil assembly (1) and a main current supply (5) energising and de-energising the main coil assembly (1), and for persisting the current flow in the main coil assembly (1) when a desired constant current level has been reached, in order to generate a central magnetic field of high homogeneity in a working volume. The apparatus further comprises a B0 shim coil assembly (2) comprising superconducting shim coils connected within a closed loop and arranged to magnetically couple with the main coil assembly (1) and an auxiliary current supply (6) for supplying current to the closed loop, and for persisting the current flow in the closed loop when a desired constant current level has been reached, in order to provide fine adjustment of the central magnetic field within the working volume without significantly degrading the homogeneity of the central magnetic field. A control circuit (31, 38) is provided for controlling the main and auxiliary current supplies (5, 6) and the main coil assembly (1), the B0 shim coil assembly (2) and the control circuit (31, 38) are adapted to at least partly compensate for the effect of variation of the magnetic field within the working volume with time. In this case the shim coil assembly performs both the function of a B0 shim and at the same time compensates for the effect of variation of the magnetic field within the working volume with time, thus avoiding the need to provide individual closed loop coil assemblies for performing these functions separately which would result in functional difficulties due to inductive coupling between these auxiliary coil assemblies.